

WHAT IS CLAIMED IS

1. In an automated printed circuit board assembly machine, a method for visualizing an item having physical  
5 features on a background, comprising the steps of:

illuminating the item with electromagnetic radiation, including the physical features and the background, using an illumination source;

forming an image of electromagnetic radiation  
10 reflected from the item, said image containing a characteristic defect depending on the type of item; and

automatically filtering said reflected electromagnetic radiation to remove said characteristic defects from said image,

15 whereby in said filtered image said characteristic defect is reduced and an improved contrast between the physical features and the background is produced.

2. The method as claimed in Claim 1, further  
20 comprising recognizing the physical features in the filtered image.

3. The method as claimed in Claim 1, wherein said electromagnetic radiation is light and said filtered  
25 image is formed by a camera.

4. The method as claimed in Claim 2, wherein said electromagnetic radiation is light, said filtered image is formed by a camera of a computer vision system, and  
30 said recognizing is performed by said computer vision system.

5. The method as claimed in Claim 1, wherein the item is a printed circuit board.

6. The method as claimed in Claim 2, wherein the  
5 item is a printed circuit board.

7. The method as claimed in Claim 1, wherein the item is a part to be mounted on a printed circuit board.

10 8. The method as claimed in Claim 2, wherein the item is a part to be mounted on a printed circuit board.

9. In an automated printed circuit board assembly machine, an apparatus for visualizing an item having  
15 physical features on a background, comprising:

one or more sources for illuminating the item with electromagnetic radiation;

an image forming device for forming an image of electromagnetic radiation reflected from the item, said  
20 image having a characteristic defect depending on the type of item;

a filter; and

an actuator positioning said filter, such that said image is formed of electromagnetic radiation passing  
25 through the filter,

whereby said filter reduces said characteristic defect in said filtered image and an improved contrast between the physical features and the background is produced.

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10. The apparatus as claimed in Claim 9, further comprising a computer vision system for recognizing the

physical features in the filtered image.

11. The apparatus as claimed in Claim 9, wherein  
said electromagnetic radiation is light and said image  
5 forming device is a camera.

12. The apparatus as claimed in Claim 10, wherein  
said electromagnetic radiation is light and said image  
forming device is a camera of said computer vision  
10 system.

13. The apparatus as claimed in Claim 9, wherein the  
item is a printed circuit board.

14. The apparatus as claimed in Claim 10, wherein  
the item is a printed circuit board.

15. The apparatus as claimed in Claim 9, wherein the  
item is a part to be mounted on a printed circuit board.

16. The apparatus as claimed in Claim 10, wherein  
the item is a part to be mounted on a printed circuit  
board.

17. The apparatus as claimed in Claim 16, further  
comprising a manipulator for positioning the part on a  
circuit board or card with recognized physical features  
of the part in registration with contact pads of the  
board or card.

18. A circuit board or card on which is surface  
mounted a part that has been recognized in accordance

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with the method of Claim 8, such surface mounting being  
with recognized physical features of the part in  
registration with contact pads of the board or card.

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